

Scotland's Rural College

Factors influencing the prevalence of animal cruelty during adolescence

Connor, M; Currie, C; Lawrence, AB

Published in:

Journal of Interpersonal Violence

DOI:

[10.1177/0886260518771684](https://doi.org/10.1177/0886260518771684)

Print publication: 01/04/2021

Document Version

Peer reviewed version

[Link to publication](#)

Citation for published version (APA):

Connor, M., Currie, C., & Lawrence, AB. (2021). Factors influencing the prevalence of animal cruelty during adolescence. *Journal of Interpersonal Violence*, 36(7-8), 3017-3040. <https://doi.org/10.1177/0886260518771684>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

1 **Factors influencing the prevalence of animal cruelty during adolescence**

2 Connor, M.¹, Currie, C.², Lawrence, A.¹

3 1. Animal Behaviour and Welfare, Scotland's Rural College (SRUC), W Mains Rd, Edinburgh,
4 Scotland, UK

5 2. Child and Adolescent Health Research Unit (CAHRU), School of Medicine, University of St
6 Andrews, St Andrews, Fife, Scotland, UK

Introduction

Human maltreatment of non-human animals is a serious ethical and social problem. Maltreatment of animals is often complex and of varying degrees of severity. Various definitions of animal cruelty, maltreatment or abuse (hereafter referred to as animal cruelty) exist in the literature. Ascione (1993) defined animal cruelty as “socially unacceptable behavior that intentionally causes unnecessary pain, suffering, or distress to and/or death of an animal” (228). This definition provides an indication of the complexity that animal cruelty behaviour presents. Animal cruelty has been described to be a multidimensional construct including amongst other aspects severity, duration, frequency and empathy (Ascione, Thompson, & Black, 1997; McPhedran, 2009b). Vermeulen distinguished between two dimensions; physical and mental animal cruelty. Physical animal cruelty and neglect can inflict pain, injuries and in very serious cases death of the animal whereas responses to mental cruelty might be less obvious but have the potential to cause negative emotional states (e.g. anxiety) and physiological stress resulting in overt behavioural expressions at a later date. Defining animal cruelty presents a difficulty for researchers due to varying perceptions for example age, gender, and culture of people e.g. participants’ definitions of animal cruelty and researchers’ definitions may be completely different and therefore validity of responses may be questionable (Pagani, Robustelli, & Ascione, 2010). Furthermore, contrasting socially and culturally sanctioned (harmful) activities, resulting from differing attitudes towards different species are difficult to account for when defining animal cruelty (Becker, 2001). Consequently, creating a global definition of animal cruelty is challenging.

Cruelty towards animals has been suggested to be indicative of later interpersonal violence McPhedran (2009a) towards humans due to its deep historical and philosophical roots (Lea & Stock)2007. Associations between childhood animal cruelty and interpersonal violence have been empirically investigated with criminal adults (Kellert & Felthous, 1985) or described in case studies (see (Ascione, 1993) for review). Furthermore, a link between childhood animal cruelty and a spectrum of violent and anti-social behaviour has been described (McPhedran, 2009a). It has been argued that cruelty towards animals may be one of the first symptoms of conduct disorder appearing in children (Ascione & Lockwood, 2001). Several family risk factors have been associated with childhood animal cruelty and

38 adult violence. These risk factors include physical abuse within the family, sexual abuse,
39 paternal alcoholism and absence, and general exposure to domestic violence (Duncan &
40 Miller, 2002). Not only experiencing family violence but also witnessing violence is
41 considered to be a risk factor for disruptive children to be cruel to animals (Duncan,
42 Thomas, & Miller, 2005). Child and adolescents' animal cruelty incidences have been
43 reported in different studies (Flynn, 1999a, 1999b, 2000; Miller & Knutson, 1997). The
44 reported proportion of participants engaging in animal cruelty acts varied a lot, however.
45 Investigating a general adolescent sample resulted in between 12% to 50% of participants
46 engaging in animal cruelty; 12% (Lucia & Killias, 2011), 21 % (Gullone & Robertson, 2008),
47 50% (Baldry, 2003). Investigated student samples ranged from 5% to 70% of participants
48 engaging in animal cruelty; 4.3% (DeGue & DiLillo, 2009)), 18% (Flynn, 1999a), 73% (Henry,
49 2004), 30% (Henry & Sanders, 2007). Half of the criminal participants engaged in animal
50 cruelty acts during their childhood or adolescence (Hensley & Tallichet, 2009). It has been
51 reported that boys were more often engaged in cruelty acts than girls (Baldry, 2003, 2004;
52 DeGue & DiLillo, 2009; Flynn, 1999a, 1999b; Gullone & Robertson, 2008; Henry, 2004; Lucia
53 & Killias, 2011) with older boys committing animal cruelty more often than younger boys
54 (Baldry, 2003). No consensus could be reached on whether being cruel to animals is a group
55 activity (Arluke, 2002) or whether adolescents act out alone (DeGue & DiLillo, 2009; Lucia &
56 Killias, 2011).

57 Cruelty acts are often directed towards companion animals such as dogs and cats
58 (DeGue & DiLillo, 2009; Lucia & Killias, 2011; Miller & Knutson, 1997) but also towards small
59 animals such as rodents, birds and reptiles (Flynn, 1999a, 1999b) . Motivations for childhood
60 animal abuse include peer pressure, sexual gratification, and post-traumatic play (Ascione et
61 al., 1997). It can also be used as a vehicle for emotional abuse in the sense of hurting others
62 by hurting animals (Ascione et al., 1997). Further motivations are to control an animal, to
63 retaliate against an animal, to satisfy prejudice against a species or breed, to express
64 aggression through an act of animal cruelty, to enhance one's own aggressiveness, to shock
65 people for amusement, to retaliate against another person, to displace hostility from a
66 person to an animal, and to act out non-specific sadism (Kellert & Felthous, 1985).

67 The presented links need to be taken seriously on both human and animal welfare
68 levels (Taylor & Signal, 2005). Interest in preventing animal cruelty is now turning into an
69 assessment of the feasibility of interagency cooperative models, whereby family and

70 children's services and animal welfare organisations investigate both human and animal
71 cruelty (Taylor & Signal, 2005).

72 Studies investigating animal cruelty employ a variety of different measures in
73 different samples. Baldry (2004) for example measured animal cruelty using the P.E.T. -
74 Physical and Emotional Tormenting Against Animals Scale (Baldry, 2004). This 9-item scale
75 measures indirect or witnessed animal abuse as well as direct abuse by the respondent. It
76 provides information about the prevalence and intensity of different types of violence
77 against animals but no information about the animal involved (Baldry, 2004). The 'Boat
78 inventory on Animal related Experiences' has been used in a number of studies (DeGue &
79 DiLillo, 2009; Flynn, 1999a; Henry & Sanders, 2007; Miller & Knutson, 1997). This measure
80 assesses pet ownership and animal cruelty in a qualitative design where respondents have
81 to describe their experiences with their pets or other animals. The 'Cruelty to Animals
82 Inventory' developed by Daads and colleagues (2004) evaluates whether and how many
83 times participants have hurt or have been cruel to an animal. It also includes the assessment
84 of the type of animal involved. A study investigating college students provided their
85 participants' with a predefined list of cruelty acts of which they could choose the acts they
86 committed (Henry & Sanders, 2007). This list included drowning, hitting or kicking, shooting,
87 choking, burning or having had sex with an animal (Henry & Sanders, 2007). Furthermore,
88 single survey items such as asking people whether they have been cruel to animals were
89 employed in a number of studies (Flynn, 1999a, 1999b; Hensley & Tallichet, 2005a, 2005b,
90 2008, 2009; Hensley, Tallichet, & Singer, 2006; Tallichet & Hensley, 2004, 2005, 2009;
91 Tallichet, Hensley, & Singer, 2005). Measures used to date have collectively a number of
92 potential short-comings that leave participants uncertain over questions such as: (a) The
93 type of abuse should participants consider as constituting physical and mental abuse; (b)
94 The degree of severity which is considered to be cruel; (c) The types of animals included in
95 the researchers' cruelty definition and whether the term animals is restricted to
96 vertebrates? The last question may play a central role as many invertebrate but also some
97 vertebrate species are regarded as 'pests' posing a perceived danger or nuisance to humans.

98 **Rationale of the present study**

99 The combined information of existing research reveals that animal cruelty is
100 prevalent in society with an onset during childhood, that there are links between animal

101 cruelty and other forms of interpersonal violence and that both animal and human welfare
102 are compromised. However, the majority of studies have used a retrospective approach to
103 assess animal cruelty with either students (Flynn, 1999a, 1999b; Henry, 2004), or criminals
104 (Miller & Knutson, 1997; Simons, Wurtele, & Durham, 2008; Tallichet & Hensley, 2004). Only
105 a few studies have used non-clinical populations to investigate animal cruelty in adolescents
106 and these studies have applied different measures with varying cruelty definitions (Baldry,
107 2003, 2004; Gullone & Robertson, 2008; Lucia & Killias, 2011). Furthermore, the applied
108 cruelty measures do not define the target animals to be considered and do not distinguish
109 between physical and mental cruelty. Therefore, the information available cannot be
110 generalised and may not be transferable to non-clinical populations. **The present study**
111 **addresses these gaps in the existing literature by: (1) investigating the prevalence of**
112 **animal cruelty in a non-clinical population of adolescents providing a detailed definition of**
113 **animal cruelty and a detailed description of the animals to be considered. Furthermore,**
114 **different types of animal cruelty were assessed over a pre-defined time frame (only**
115 **comprising adolescent years) including accidental cruelty, deliberate cruelty and neglect.**
116 **(2) The present study also investigates potential predictors of animal cruelty in a non-**
117 **clinical sample including socio-demographic variables such as pet-ownership, gender and**
118 **family affluence, and the prevalence of anti-social behaviour in combination with the**
119 **perceived acceptability of animal cruelty in society.**

120

121

Methods

Questionnaire

123 In order to account for schools varying opportunities to access online surveys a
124 paper pencil and an identical online questionnaire were created. For a paper-pencil version
125 Snap Surveys software was used and Bristol Online Surveys (BOS) software was used to
126 create an identical online version of the survey questionnaire. The questionnaire was
127 designed to be completed during one teaching unit (maximum 45mins). **The questionnaire**
128 **was administered during class time and teachers were free to choose during which class**
129 **the questionnaire was administered. However, teachers choose classes where all students**
130 **participated in the study.** Ethical consent for the questionnaire was gained from the
131 University of St. Andrews Medical School. Prior to sampling schools, local authority consent
132 was gained. The online questionnaire was sent out to schools.

133

134 Recruitment

135 In order to access Scottish schools all 32 local authoritiesⁱ were approached and
136 further ethical approval was sought. As a result 11 (34%) local authorities granted their
137 approval; some of them provided the schools to approach whereas others did not.
138 Therefore, head teachers of schools provided were approached and for the other local
139 authorities we approached the last alphabetical secondary school. Head teachers received
140 an invitation email and if no reply was received within 4 weeks an additional invitation letter
141 was sent to the respective schools. Furthermore, schools were also contacted via phone to
142 arrange the research. Schools were offered both the online version providing a link to the
143 questionnaire and the paper pencil version. Furthermore, 75 private schools in Scotland
144 were approached of which 21 read the invitation and one school agreed to participate in the
145 study. Since the response rate was very low we additionally recruited via snowball sampling
146 and a Biology teachers' network. Recruitment of schools in England and Wales did not
147 require approval from local authorities and schools were therefore contacted directly.
148 Similarly we approached the last alphabetical secondary school of each county. The
149 response rate was also very low, the online questionnaire was completed by all English (n =
150 143) and Welsh (n = 7) participants completed the survey. All schools were offered free
151 animal welfare education material and/or a visit by an animal welfare scientist to give a talk.
152 Due to the variety of sampling approaches it is not possible to calculate a response rate.
153 There were no gender or age differences between the two questionnaire dissemination
154 strategies and consequently all participants were analysed as a single sample. The
155 questionnaire was completed during school hours independently of which version
156 adolescents received.

157

158 **Measures**

159 The questionnaire explored several constructs related to perceptions of animals but
160 only measures relevant to animal cruelty will be presented here. At the beginning of the
161 questionnaire adolescents were asked socio-demographic questions such as age, gender,
162 pet ownership and self-reported living area (town, village or farm were coded as rural and
163 city and sub-burb were coded as urban). Pet ownership was assessed using an adapted
164 version of the Boat Inventory (Boat, 1999)

165 Adolescent's social economic status was assessed using the Family Affluence Scale
166 (FAS), which was developed for an international study on school-aged children's health
167 (Batista-Foguet, Fortiana, Currie, & Villalbii, 2004). This scale assessed adolescents' social-
168 economic status utilising material markers such as number of computers, cars and holidays.

169 In order to investigate self-reported animal cruelty behaviour, items concerning
170 deliberate cruelty but also accidental cruelty and neglect were created (based on Daad,
171 2004). In total 11 items (Table 1) were used to assess animal cruelty in terms of accidental
172 cruelty (e.g. frightening an animal accidentally), deliberate cruelty (e.g. hurting an animal on
173 purpose) and neglect (e.g. forgetting to feed an animal). Cruelty acts were assessed over the
174 last twelve months offering the answer categories never, 1-2 times, 2-5 times and more
175 than 5 times. The question clearly stated that only cruelty acts against mammals (e.g. pets,
176 farm and wild animals), birds, reptiles (e.g. lizards, snakes), amphibians (e.g. frogs) and fish
177 should be taken into account. It further stated that acts towards insects (e.g. flies, bees,
178 mosquitos) or molluscs (e.g. slugs and snails) should not be recorded when answering the
179 question. These items were then used to create another set of items to investigate
180 adolescents' perceptions of the acceptability of animal cruelty (Table 2). In total 12 items
181 were used to evaluate acceptability of animal cruelty. Participants were asked to rate the
182 acceptability of animal cruelty on a 6 point likert scale ranging from 1 = not at all acceptable
183 to 6 = very acceptable.

184 Problem (anti-social) behaviour was assessed using adapted items from (Loeber,
185 Farrington, Stouthamer-Loeber, & Van Kammen, 1998). Items were rephrased to make
186 them applicable to a British context after pre-testing the questionnaire (for example movie
187 was replaced with film. Furthermore, dichotomous answering categories (yes/no) were
188 changed into how many times in the past 12 months problem behaviours have occurred
189 offering the options never, 1-2 times, 3-4 times, 5-6 times and more often. In total 9 items
190 were used to form the problem behaviour measure: In the last 12 months how often have
191 you done the following things? (a) cut classes or stayed away from school without
192 permission (b) taken a car or other vehicle without owner's permission, just to drive around
193 (c) been drunk in a public place (d) broke in or tried to break into a building just for fun or to
194 look around (e) thrown objects such as rocks or bottles at people to hurt or scare them (f)
195 sneaked into a movie, ballgame or something like that without paying (g) steal money or
196 take something that did not belong to you (h) beat up someone or fought someone

197 physically because they made you angry (i) purposely damaged or destroyed property that
198 did not belong to you.

199 Development of the questionnaire was assisted by DEFRA (Department for
200 Environment, Food and Rural Affairs in the UK), animal welfare charities and organisations
201 and secondary school children and teachers who helped evaluate applicability and content
202 validity. The questionnaire was approved by the ethics committee of the University of St.
203 Andrews and was pre-tested with 87 secondary school children.

204 At any point during the development and also during the data collection phase,
205 children were free to decide whether they wanted to take part or not. Children could exit
206 the questionnaire at any time or leave questions blank in the paper pencil version without
207 consequences. Missing values in the data set were not replaced and therefore the number
208 of respondents varies in the analysis.

209

210 **Data analysis**

211 Paper pencil questionnaires were scanned using the SnapSurvey Software, data
212 obtained online were extracted from BOS and merged with the paper pencil data in SPSS 22.
213 Data were analysed using the statistical package SPSS 22. Descriptive statistics were used to
214 provide sample descriptions. Differences in count data were analysed using χ^2 statistics.
215 Reliability of the measures applied was analysed using Cronbach's alpha. Exploratory factor
216 analysis with principle components as extraction method was used to investigate the
217 underlying structure of adolescents' animal cruelty behaviour. Mean differences were
218 analysed using t-test statistics or Analysis of Variance (ANOVA), effect sizes were calculated
219 using means and standard deviations and are presented as Cohen's d. A general linear
220 model with repeated measures was used to evaluate differences between the cruelty
221 components. A multiple regression analysis using the enter method was applied to
222 investigate predictors of deliberate animal cruelty.

223

224

224 **Results**

225 **Participants**

226 A total of 979 adolescents participated in the survey questionnaire of which 83.6%
227 (N = 764) lived in Scotland, 15.6% (n = 143) lived in England and 0.8% (n = 7) lived in Wales.
228 Due to the unequal group sizes no country comparisons were conducted and the whole

229 sample was analysed together. Forty-three per cent ($n = 419$) of the participants were male,
230 51% ($n = 497$) of the participants were female and six per cent ($N = 63$) did not report their
231 gender. The mean age for all participants was 15.1 years ($SD = 1.57$). Boys were on average
232 15 years old ($SD_{\text{boys}} = 1.51$) and girls were on average 15.2 years ($SD_{\text{girls}} = 1.61$) old. Fifty five
233 per cent ($n = 539$) of adolescents stated they lived in urban areas and 32% ($N = 306$)
234 indicated they live in rural areas; 14% ($n = 134$) of adolescents didn't report where they
235 lived. When comparing valid answers with the census data of Scotland the rural urban
236 distribution of 12 to 17 year olds only slightly varies from the Scottish average (urban
237 sample = 63.6%, urban census = 66.75, rural sample = 36.6%, rural census = 33.3%).

238 Most adolescents ($n = 832$, 91.6%) reported that they had lived with a pet in the
239 past, and 73.9% ($n = 666$) of the adolescents said they currently live with a pet which is
240 comparable with other data published on pet ownership in the UK (Marsa-Sambola et al.,
241 2016; Murray, Browne, Roberts, Whitmarsh, & Gruffydd-Jones, 2010). Seventy-four percent
242 of boys ($n = 303$) and girls ($n = 359$) reported having a pet. Similarly, 71% ($n = 372$) of urban
243 adolescents reported having a pet whilst 80% ($n = 245$) of rural adolescents reported having
244 a pet ($\chi^2 = 15.2$, $p = .001$).

245 The most common pets were fish ($n = 405$), followed by dogs ($n = 368$), hamsters and
246 guinea pigs ($n = 341$), and cats ($n = 240$). Girls had significantly more hamsters and guinea
247 pigs ($\chi^2 = 12.72$, $p < .001$) and rabbits ($\chi^2 = 4.74$, $p = .030$) than boys. There were no gender
248 differences regarding the other animals (dogs, cats, birds, fish, horse, mice, wild animals and
249 reptiles) that adolescents reported living with.

250 There were differences between rural and urban adolescents regarding pets living in
251 the house and the type of pet they would have in their family. Rural adolescents had
252 significantly more cats than urban adolescents ($\chi^2 = 8.48$, $p = .014$). Furthermore, rural
253 adolescents reported living less with birds ($\chi^2 = 8.46$, $p = .015$), fish ($\chi^2 = 26.36$, $p < .001$), and
254 mice ($\chi^2 = 14.39$, $p < .001$). However, rural adolescent families reported living significantly
255 more with horses ($\chi^2 = 24.08$, $p < .001$), wild animals ($\chi^2 = 13.26$, $p < .001$), and other animals
256 ($\chi^2 = 32.4$, $p < .001$) such as sheep and cows.

257 A composite score was calculated for family affluence, which divides adolescents
258 into three groups; low, medium and high affluence. There was almost an equal distribution
259 with 29.2% ($N = 286$) of the adolescents reporting low family affluence, 36.3% ($N = 355$)

260 reporting medium family affluence and 34.5% (338) of adolescents reporting high family
261 affluence.

262

263 **Animal cruelty**

264 In total 11 items were used to measure self-reported animal cruelty. Analysis shows
265 a good reliability Cronbach's $\alpha = .793$. Adolescents in this sample generally report low levels
266 of animal cruelty ($M = 1.32$, $SD = 0.35$, $n = 837$). The underlying structure of adolescents'
267 animal cruelty behaviour was investigated using exploratory factor analysis (Table 2), and
268 results reveal that adolescents show different types of cruelty towards animals. An item
269 content analysis indicates that items containing words such as 'on purpose' load together;
270 these components were subsequently labelled as *deliberate cruelty* (Cronbach's $\alpha = .682$, N
271 $= 5$). Items containing 'accidental' loaded on a second factor and were labelled *accidental*
272 *cruelty* (Cronbach's $\alpha = .698$, $N = 3$). The third component comprised items relating to
273 forgetting to feed or water a pet and were labelled *neglect* (Cronbach's $\alpha = .639$, $N = 3$).
274 These three components account for 56.7% of the variance. Adolescents reported that they
275 had been engaged in accidental animal cruelty more often ($M = 1.58$, $SD = 0.57$, $n = 837$)
276 than in deliberate cruelty ($M = 1.24$, $SD = 0.41$, $n = 837$, $t = 18.506$, $df = 836$, $p < .001$) and
277 neglect ($M = 1.18$, $SD = 0.37$, $n = 833$, $t = -20.423$, $df = 832$, $p < .001$). In order to test that
278 these differences are independent from the large sample size Cohen's d was calculated as a
279 measure of effect size. Cohen's d for the accidental vs. deliberate cruelty was 0.674 and for
280 the accidental cruelty vs. neglect was 0.818. Both effect sizes suggest strong effects. 54.4%
281 ($n = 455$) of adolescents reported to have never been engaged in deliberate cruelty acts (this
282 analysis only takes adolescents into account who answered all cruelty questions).

283 A small but significant difference resulted comparing reported neglect between boys
284 and girls; boys reported higher levels of neglect than girls $p = .024$ (a detailed analysis of all
285 comparisons can be found in Table 3). Effect size for this difference is small $d = .154$.
286 Differences in reported neglect were also present between pet owners and non-pet owners
287 $p < .000$, with the effect size of $d = .436$ suggesting a medium strong effect. Those
288 differences remain when analysing pet ownership in dependence of gender, living area and
289 age group (Table 3). Furthermore, a small difference ($p = .033$, $d = .197$) in reported neglect
290 was found analysing for family affluence with adolescents reporting medium family

291 affluence stating higher levels of neglect than adolescent's reporting high family affluence
 292 (Table 3). No differences were observed comparing different age groups or urban and rural
 293 adolescents.

294 Self-reported accidental cruelty differed among boys and girls $p < .000$, between 12-
 295 13 year olds and >16 year olds $p = .017$, rural and urban adolescents $p = .014$, and between
 296 pet owners and non-pet owners $p = .000$. Effect sizes range from small to medium strong
 297 effects (Table 3). Girls, older adolescents, urban and non-pet owning adolescents reported
 298 lower levels of accidental cruelty than boys, younger adolescents, rural and pet-owning
 299 adolescents. Small gender differences are shown between urban boys and girls ($t(420.4) =$
 300 $2.49, p = .013, d = .219$) but not between rural boys and girls. Differences between pet and
 301 non-pet owners are constant and can also be shown when analysing the age groups
 302 separately (12-13 year olds: $t(294) = 2.38, p = .018, d = .336$, 14-15 year olds: $t(349) = 2.22, p$
 303 $= .027, d = .258$, >16 year olds: $t(105.8) = 4.02, p = .000, d = .652$). Furthermore, similar
 304 differences were found when analysing rural and urban adolescents separately (urban:
 305 $t(485) = 3.33, p = .001, d = .339$, rural: $t(273) = 2.14, p = .034, d = .347$).

306 Self-reported deliberate cruelty differs between boys and girls ($p < .000$) with boys
 307 reporting higher levels than girls and between rural and urban adolescents ($p = .012$) with
 308 rural adolescents reporting higher levels than urban adolescents (Table 3). Gender
 309 differences are also prominent when investigating rural and urban adolescents separately
 310 for both living areas (urban: $t(316.3) = 4.79, p = .000, d = .448$, rural: $t(199.7) = 3.07, p$
 311 $= .002, d = .364$). Furthermore, gender differences were also observed in 12-13 year olds and
 312 14-15 year olds (12-13 year olds: $t(243.7) = 2.42, p = .016, d = .280$, 14-15 year olds: $t(261) =$
 313 $4.53, p = .000, d = .487$) but not in adolescents older than 16 years. Small differences were
 314 observed comparing adolescents of varying family affluence (Table 3). Adolescents of
 315 medium family affluence reported higher levels of deliberate cruelty than adolescents of
 316 low family affluence ($p = .005$).

317

318 **Acceptability of animal cruelty**

319 The 12 items assessing acceptability of animal cruelty showed a good overall
 320 reliability (Cronbach's $\alpha = .849, N = 12$). Results show that four components can be
 321 extracted accounting for 73.1% of the variance (Table 2). Similarly to cruelty behaviour an

322 item content analysis was used to label the factors. Component 1 represents items
323 concerning neglect (Cronbach's $\alpha = .727$, $N = 2$, $M = 1.88$, $SD = .90$), component 2 comprises
324 items about deliberate mental cruelty (Cronbach's $\alpha = .768$, $N = 3$, $M = 1.49$, $SD = .75$),
325 component 3 items about accidental cruelty (Cronbach's $\alpha = .936$, $N = 3$, $M = 2.26$, $SD =$
326 1.21), and component 4 includes items about deliberate physical cruelty (Cronbach's $\alpha =$
327 $.736$, $N = 2$, $M = 1.15$, $SD = .53$). PCA loadings suggest that the item 'kill an animal' loads on
328 the factor labelled deliberate physical cruelty (Table 2), however reliability analysis suggest
329 removing the item to increase reliability from Cronbach's $\alpha = .549$ to Cronbach's $\alpha = .736$.
330 Consequently the item was removed for further analysis. A general linear model with
331 repeated measures was used to evaluate differences between the cruelty components.
332 Results show that the acceptability of different types of animal cruelty is different
333 ($F(1.93/1589.94) = 368.18$, $p = .000$). Pairwise comparisons reveal differences between all
334 pairs were $p < .000$. Deliberate physical animal cruelty ($M = 1.15$, $SE = 0.02$) is the least
335 accepted type of cruelty, followed by deliberate psychological cruelty ($M = 1.49$, $SE = 0.03$),
336 neglect ($M = 1.79$, $SE = 0.03$) and accidental cruelty respectively ($M = 2.16$, $SE = 0.04$).
337 Gender differences were found for the acceptability of neglect ($t(737.4) = 2.04$, $p = .042$, $d =$
338 $.143$), deliberate physical cruelty ($t(261) = 4.53$, $p = .000$, $d = .487$) and accidental cruelty
339 ($t(503.9) = 3.76$, $p = .000$, $d = .296$) with boys finding all three types of cruelty more
340 acceptable than girls (Table 5). However, effect sizes indicate small differences. Differences
341 in acceptability of deliberate physical ($F(2) = 4.86$, $p = .008$) and psychological animal cruelty
342 ($F(2) = 7.63$, $p = .000$) could also be observed comparing the different age groups (Table 5).
343 Post-hoc tests reveal differences between 14-15 year olds and >16 year olds with the
344 younger ages showing greater acceptability than the older adolescents. Effect sizes indicate
345 medium strong to strong effects. Differences in socio-economic status were only present for
346 the acceptability of psychological cruelty. However, the effect size $d = .232$ is small.

347 Furthermore, anti-social behaviour was evaluated; reliability of the scale used to
348 measure anti-social behaviour was high Cronbach's $\alpha = .903$, $N = 9$ and a mean score was
349 created the lower the score the less adolescents reported anti-social behaviour. In general
350 boys ($M = 1.33$, $SD = .70$, $n = 312$) show higher levels of anti-social behaviour ($t(420.8) =$
351 4.87 , $p < .001$, $d = .363$) than girls ($M = 1.13$, $SD = .34$, $n = 414$). A medium strong correlation

352 exists between antisocial behaviour and deliberate animal cruelty $r = .334, p < .001$. There
353 was no significant correlation between antisocial behaviour and neglect.

354 **Predicting deliberate animal cruelty**

355 A multiple regression analysis (Table 6) was used to investigate predictors of
356 deliberate animal cruelty. Predictor variables were acceptability of different types of animal
357 cruelty, anti-social behaviour and demographic variables including, gender, pet ownership
358 and family affluence. All predictor variables explain a significant amount of the variance in
359 deliberate animal cruelty ($F(10,648) = 45.4, p < .001, R^2 = .41 R^2_{adjusted} = .40$). Inspection of
360 tolerance levels show low levels of multicollinearity (observed levels of tolerance are
361 between .370 and .958). The analysis shows that the acceptability of both physical and
362 psychological deliberate cruelty are strong predictors for deliberate animal cruelty (Table 6).
363 Furthermore, anti-social behaviour and adolescent's living place are also part of the model
364 and explain a small but significant amount of the variance.

365 **Discussion**

366 The present study explored the prevalence of animal cruelty in a non-clinical sample
367 of adolescents. It used a new approach to assessing animal cruelty that distinguished
368 between deliberate and non-deliberate animal cruelty, and where adolescents received
369 information about what type of animals to include when **reporting** cruelty acts.
370 Furthermore, the study included a timeframe of the last 12 months to assess cruelty acts
371 enabling adolescence to provide more accurate assessments of their behaviours. Assessing
372 animal cruelty retrospectively without providing a time frame may bias the accuracy of the
373 recall especially when experiences rely on judgement and interpretation (Hardt & Rutter,
374 2004). Providing a specific time frame, which does not reach too far into the past, takes
375 account of recall bias and provides a more accurate evaluation of the behaviour.

376 For this study only vertebrate animals were included since the UK Animal Welfare Act from
377 2006 only protects vertebrate species due to a lack of evidence on sentience in
378 invertebrates (see <http://www.legislation.gov.uk/ukpga/2006/45/notes/contents>; although
379 note that UK animal experimentation legislation does provide protection for cephalopods;
380 see <https://www.gov.uk/government/publications/consolidated-version-of-aspa-1986>). This

381 may differ between countries and needs to be taken into account when evaluating animal
382 cruelty. When analysing all cruelty acts together, results show low levels of reported animal
383 cruelty in general ($M = 1.32$, $SD = 0.35$). However, exploratory factor analysis revealed three
384 types of animal cruelty: accidental animal cruelty, neglect and deliberate animal cruelty
385 confirming our initial distinction between deliberate and non-deliberate cruelty acts.
386 Examples of deliberate animal cruelty include ‘hurting an animal on purpose’ and for
387 deliberate mental animal cruelty ‘annoying or frightening an animal on purpose’. Half of the
388 adolescents ($n = 300$) reported to have been engaged in deliberate animal cruelty within the
389 last twelve months on at least one or two occasions. These numbers seem to be consistent
390 with previous findings (Flynn, 2001; Gullone & Robertson, 2008). Nonetheless, it has to be
391 noted that currently no existing measure of animal cruelty includes a timeframe for cruelty
392 acts unlike the present study which used a time frame of 12 months. Since it is not specified
393 in the literature as to when these animal cruelty acts were conducted and how often
394 animals have been perpetrated during participants’ childhood it is difficult to compare the
395 findings of the present study with previous work. Furthermore, adolescents also reported to
396 have been involved in accidental animal cruelty more often than in deliberate cruelty or
397 neglect. This result shows the necessity to differentiate between cruelty acts, as accidental
398 animal cruelty may bias prevalence of animal cruelty acts especially in samples with a high
399 number of pet-owners. Pet-owners show significantly higher accidental animal cruelty and
400 neglect than non-pet-owners. A simple explanation for this is that the chances of
401 accidentally harming an animal are higher when owning a pet compared to not owning a
402 pet. It has to be noted that both pet owners and no-pet-owners answered the questions
403 regarding neglect. Participants had the option to choose never (which is coded as 1). The
404 mean for non-pet owners shows that non-pet owners most often chose never (1) ($M = 1.07$,
405 $SD = 0.29$). We don’t specify as to whether participants should think of their own pet (which
406 they don’t have in this case). We only analysed current pet-ownership so it could well be
407 that current non-pet owners have had a pet in the last 12 months but not at the time when
408 the questionnaire was conducted or they were looking after someone else’s pet, so they
409 could potentially have been involved in neglect. Since rural adolescents reported to own
410 pets more often than urban adolescents, rural adolescents also reported higher accidental
411 cruelty acts. It has to be noted that younger adolescents show higher levels of accidental
412 cruelty than older ones despite not differing in pet ownership. This indicates that

413 adolescents may learn to be more careful with pets due to gaining more responsibility and
414 knowledge which has been shown to occur in other studies (Covert, Whiren, Keith, &
415 Nelson, 1985). The present study reveals gender differences with medium strong effect
416 sizes, with boys reporting higher levels of deliberate animal cruelty than girls. Studies
417 investigating non-clinical samples retrospectively also found boys admitting more cruelty
418 acts than girls (Becker, Stuewig, Herrera, & McCloskey, 2004; Flynn, 1999a).

419 To evaluate the acceptability of animal cruelty, items were created on the basis of
420 items used to measure the prevalence of animal cruelty. Therefore, items didn't describe
421 specific cruelty acts nor include different levels of severity. Exploratory factor analysis
422 suggests a four factor solution; acceptability of neglect, acceptability of accidental cruelty,
423 acceptability of deliberate physical and acceptability of deliberate mental animal cruelty.
424 Results show that deliberate physical cruelty is the least accepted form of animal cruelty
425 followed by deliberate mental animal cruelty, neglect and accidental cruelty respectively. It
426 has to be noted that neglect was assessed using items such as 'forgetting to feed an animal'
427 or 'leaving an animal alone with enough food and water for a few days'. These are rather
428 mild forms of neglect and may bias the acceptability of neglect, which can potentially have
429 severe negative outcomes for the animals involved. When evaluating the acceptance of
430 animal cruelty adolescents clearly distinguish between deliberate physical and mental
431 cruelty, with physical cruelty evaluated as the least acceptable form of animal cruelty.
432 Whilst factor scores indicated the inclusion of the item 'kill an animal' into deliberate
433 physical cruelty, reliability analysis suggested removing that item. As the purpose of killing
434 was not stated within the item it may have been difficult for the participants to judge the
435 acceptability of killing an animal. Some participants could evaluate killing an animal for food
436 in general or more specifically in a humane way as being acceptable. Other participants may
437 have considered killing an animal for fun or out of curiosity and regard such actions as
438 unacceptable. If an item on killing animals is to be included in future research the purpose
439 of killing should be clearly stated.

440 The present study found weak but significant gender differences for the acceptability
441 of deliberate physical cruelty, acceptability of neglect and acceptability of accidental cruelty
442 but not for the acceptance of deliberate mental cruelty. Male adolescents in general had
443 higher levels of acceptability for all types of cruelty acts than females. Studies have shown

444 that attitudes towards the treatment of animals differ between males and females (Herzog,
445 2007). However, the studies reviewed by Herzog (2007) mostly concern attitudes towards
446 animal experimentation and not the acceptability of animal cruelty. Nonetheless, the
447 authors conclude that women generally show more concern for the welfare of animals than
448 men and that women are more sympathetic to the treatment of animals than men (Herzog,
449 2007). It has also been shown that girls show higher levels of attachment to their pets than
450 boys (Marsa-Sambola et al., 2016) and women are more empathetic towards animals (Paul,
451 2000).

452 Predictors of deliberate animal cruelty were evaluated and results show that
453 participants' acceptability of deliberate cruelty, both physical and mental, are highly
454 predictive for committing deliberate cruelty. Furthermore, whether participants live in rural
455 or urban areas and their reported anti-social behaviour are small but significant contributors
456 to committing deliberate cruelty. Measured predictor variables account for about 41% of
457 the explained variance in a non-clinical sample. It has been empirically shown that childhood
458 animal cruelty has an association with interpersonal violence (Kellert & Felthous, 1985). A
459 medium strong correlation was found between deliberate cruelty and anti-social behaviour
460 supporting the hypothesis that animal cruelty is more common in children with anti-social
461 personality traits (Gleyzer, Felthous, & Holzer, 2002). The measure used to assess anti-social
462 behaviour comprises different aspects but only includes one item, which measures violence.
463 A measure specifically addressing interpersonal violence may have resulted in stronger
464 correlations. In order to explain the remaining amount of variance family risk factors and
465 witnessing violence can be taken into account (Duncan et al., 2005). However, it is difficult
466 to include those family risk factors when investigating a non-clinical sample of adolescence
467 recruited through schools since this could cause distress in affected adolescents. Therefore,
468 the present study did not employ a measure of family risk factors.

469 In conclusion the present study shows for the first time the importance of
470 distinguishing between different types of cruelty acts when studying cruelty to animals in
471 adolescents. Furthermore, the study demonstrates the importance of defining what types of
472 animals are included in the definition and the time scale over which cruelty acts have been
473 committed in order for a more accurate picture of cruelty to be developed. Adolescents
474 perceive deliberate and non-deliberate act of animal cruelty differently. Acceptance of non-

475 deliberate cruelty acts is higher, as is the prevalence of these acts. Accidental animal cruelty
476 acts are mostly reported by younger pet owning adolescents indicating a need for
477 prevention interventions to this age group. The acceptability of cruelty acts plays a
478 significant role in predicting animal cruelty, together with anti-social behaviours and place
479 of living. However it has to be noted that this study has been conducted in a classroom
480 setting and even though complete anonymity was insured participants may have not felt
481 completely comfortable expressing themselves. This may have resulted in weaker
482 differences between male and female participants than in other studies where no authority
483 person was present. Sensitive topics such as studying cruelty towards animals may result in
484 participants answering in accordance to what they perceive as most acceptable in society
485 (Fisher, 1993).

486

487

488

References

- 489 Arluke, A. (2002). Animal abuse as dirty play. *Symbolic Interaction*, 25(4), 405-430.
- 490 Ascione, F. R. (1993). Children who are cruel to animals: A review of research and implications for
491 developmental psychopathology. *Anthrozoos: A Multidisciplinary Journal of The Interactions*
492 *of People & Animals*, 6(4), 226-247.
- 493 Ascione, F. R., & Lockwood, R. (2001). Cruelty to animals: Changing psychological, social, and
494 legislative perspectives. *The state of the animals*, 39-54.
- 495 Ascione, F. R., Thompson, T. M., & Black, T. (1997). Childhood cruelty to animals: Assessing cruelty
496 dimensions and motivations. *Anthrozoos: A Multidisciplinary Journal of The Interactions of*
497 *People & Animals*, 10(4), 170-177.
- 498 Baldry, A. C. (2003). Animal abuse and exposure to interparental violence in Italian youth. *Journal of*
499 *Interpersonal Violence*, 18(3), 258-281.
- 500 Baldry, A. C. (2004). The development of the PET Scale for the measurement of physical and
501 emotional tormenting against animals in adolescents. *Society and Animals*, 12(1), 1-17.
- 502 Batista-Foguet, J. M., Fortiana, J., Currie, C., & Villalbii, J. R. S.-e. i. i. s. f. c. b. c. (2004). Socio-
503 economic indexes in surveys for comparisons between countries. *Social Indicators Research*,
504 67(3), 315-332.
- 505 Becker, F. (2001). *The links between child abuse and animal abuse*: NSPCC London.
- 506 Becker, K. D., Stuewig, J., Herrera, V. M., & McCloskey, L. A. (2004). A study of firesetting and animal
507 cruelty in children: Family influences and adolescent outcomes. *Journal of the American*
508 *Academy of Child & Adolescent Psychiatry*, 43(7), 905-912.
- 509 Boat, B. W. (1999). Abuse of children and abuse of animals: Using the links to in-form child
510 assessment and protection. . In I. F. A. P. Arkow (Ed.), *Child abuse, domestic violence, and*
511 *animal abuse: Linking the circles of compassion for prevention and interventio* (pp. 83-100).
512 West Lafayette: Purdue University Press.
- 513 Covert, A. M., Whiren, A. P., Keith, J., & Nelson, C. (1985). Pets, Early Adolescents, and Families
514 *Marriage & Family Review*, 8(3-4), 95-108.
- 515 Dadds, M. R., Whiting, C., Bunn, P., Fraser, J. A., Charlson, J. H., & Pirola-Merlo, A. (2004).
516 Measurement of Cruelty in Children: The Cruelty to Animals Inventory. *Journal of Abnormal*
517 *Child Psychology*, 32(3), 321-334. doi:10.1023/B:JACP.0000026145.69556.d9#page-1
- 518 DeGue, S., & DiLillo, D. (2009). Is animal cruelty a "red flag" for family violence? Investigating co-
519 occurring violence toward children, partners, and pets. *Journal of Interpersonal Violence*,
520 24(6), 1036-1056.
- 521 Duncan, A., & Miller, C. (2002). The impact of an abusive family context on childhood animal cruelty
522 and adult violence. *Aggression and Violent Behavior*, 7(4), 365-383.
- 523 Duncan, A., Thomas, J. C., & Miller, C. (2005). Significance of family risk factors in development of
524 childhood animal cruelty in adolescent boys with conduct problems. *Journal of Family*
525 *Violence*, 20(4), 235-239.
- 526 Flynn, C. P. (1999a). Animal abuse in childhood and later support for interpersonal violence in
527 families. *Society & Animals: Journal of Human-Animal Studies*, 7(2), 161-172.
528 doi:10.1163/156853099X00059
- 529 Flynn, C. P. (1999b). Exploring the link between corporal punishment and children's cruelty to
530 animals. *Journal of Marriage and the Family*, 61, 971-981.
- 531 Flynn, C. P. (2000). Why family professionals can no longer ignore violence toward animals. *Family*
532 *Relations*, 49(1), 87-95.
- 533 Flynn, C. P. (2001). Acknowledging the " Zoological connection": A sociological analysis of animal
534 cruelty. *Society and Animals*, 9(1), 71-87.
- 535 Gleyzer, R., Felthous, A. R., & Holzer, C. E. (2002). Animal cruelty and psychiatric disorders. *Journal of*
536 *the American Academy of Psychiatry and the Law Online*, 30(2), 257-265.

- 537 Gullone, E., & Robertson, N. (2008). The relationship between bullying and animal abuse behaviors
 538 in adolescents: The importance of witnessing animal abuse. *Journal of Applied*
 539 *Developmental Psychology*, *29*(5), 371-379. doi:10.1016/j.appdev.2008.06.004
- 540 Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood
 541 experiences: review of the evidence. *Journal of Child Psychology and Psychiatry*, *45*(2), 260-
 542 273. doi:10.1111/j.1469-7610.2004.00218.x
- 543 Henry, B. C. (2004). The relationship between animal cruelty, delinquency, and attitudes toward the
 544 treatment of animals. *Society and Animals*, *12*(3), 185-207.
- 545 Henry, B. C., & Sanders, C. E. (2007). Bullying and animal abuse: is there a connection? *Society and*
 546 *animals*, *15*(2), 107-126.
- 547 Hensley, C., & Tallichet, S. E. (2005a). Animal cruelty motivations: assessing demographic and
 548 situational influences. *J Interpers Violence*, *20*(11), 1429-1443.
 549 doi:10.1177/0886260505278714
- 550 Hensley, C., & Tallichet, S. E. (2005b). Learning to be cruel?: Exploring the onset and frequency of
 551 animal cruelty. *International Journal of Offender Therapy and Comparative Criminology*,
 552 *49*(1), 37-47.
- 553 Hensley, C., & Tallichet, S. E. (2008). The Effect of Inmates' Self-Reported Childhood and Adolescent
 554 Animal Cruelty Motivations on the Number of Convictions for Adult Violent Interpersonal
 555 Crimes. *International Journal of Offender Therapy and Comparative Criminology*, *52*(2), 175-
 556 184.
- 557 Hensley, C., & Tallichet, S. E. (2009). Childhood and adolescent animal cruelty methods and their
 558 possible link to adult violent crimes. *Journal of interpersonal violence*, *24*(1), 147-158.
- 559 Hensley, C., Tallichet, S. E., & Singer, S. D. (2006). Exploring the possible link between childhood and
 560 adolescent bestiality and interpersonal violence. *Journal of Interpersonal Violence*, *21*(7),
 561 910-923.
- 562 Herzog, H. A. (2007). Gender differences in human-animal interactions: A review. *Anthrozoos: A*
 563 *Multidisciplinary Journal of The Interactions of People & Animals*, *20*(1), 7-21.
- 564 Kellert, S. R., & Felthous, A. R. (1985). Childhood cruelty toward animals among criminals and
 565 noncriminals. *Human Relations*.
- 566 Lea, S. G., & Stock, B. (2007). Animal Abuse: Hardening children's heart. *Proteus*, *1*(1), 37-43.
- 567 Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., & Van Kammen, W. B. (1998). *Antisocial*
 568 *behavior and mental health problems: Explanatory factors in childhood and adolescence*.
- 569 Lucia, S., & Killias, M. (2011). Is animal cruelty a marker of interpersonal violence and delinquency?
 570 Results of a Swiss National Self-Report study. *Psychology of Violence*, *1*(2), 93.
- 571 Marsa-Sambola, F., Muldoon, J., Williams, J., Lawrence, A., Connor, M., & Currie, C. (2016). The Short
 572 Attachment to Pets Scale (SAPS) for Children and Young People: Development, Psychometric
 573 Qualities and Demographic and Health Associations. *Child Indicators Research*, *9*(1), 111-131.
 574 doi:10.1007/s12187-015-9303-9
- 575 McPhedran, S. (2009a). Animal Abuse, Family Violence, and Child Wellbeing: A Review. *Journal of*
 576 *Family Violence*, *24*(1), 41-52. doi:10.1007/s10896-008-9206-3
- 577 McPhedran, S. (2009b). A review of the evidence for associations between empathy, violence, and
 578 animal cruelty. *Aggression and Violent Behavior*, *14*(1), 1-4. doi:10.1016/j.avb.2008.07.005
- 579 Miller, K. S., & Knutson, J. F. (1997). Reports of severe physical punishment and exposure to animal
 580 cruelty by inmates convicted of felonies and by university students. *Child Abuse & Neglect*,
 581 *21*(1), 59-82.
- 582 Murray, J. K., Browne, W. J., Roberts, M. A., Whitmarsh, A., & Gruffydd-Jones, T. J. (2010). Number
 583 and ownership profiles of cats and dogs in the UK. *Vet Rec*, *166*(6), 163-168.
 584 doi:10.1136/vr.b4712
- 585 Pagani, C., Robustelli, F., & Ascione, F. R. (2010). Investigating animal abuse: Some theoretical and
 586 methodological issues. *Anthrozoos: A Multidisciplinary Journal of The Interactions of People*
 587 *& Animals*, *23*(3), 259-276.

- 588 Paul, E. S. (2000). Empathy with animals and with humans: Are they linked? *Anthrozoos: A*
589 *Multidisciplinary Journal of The Interactions of People & Animals*, 13(4), 194-202.
- 590 Simons, D. A., Wurtele, S. K., & Durham, R. L. (2008). Developmental experiences of child sexual
591 abusers and rapists. *Child Abuse Negl*, 32(5), 549-560. doi:10.1016/j.chiabu.2007.03.027
- 592 Tallichet, S. E., & Hensley, C. (2004). Exploring the link between recurrent acts of childhood and
593 adolescent animal cruelty and subsequent violent crime. *Criminal Justice Review*, 29(2), 304-
594 316.
- 595 Tallichet, S. E., & Hensley, C. (2005). Rural and urban differences in the commission of animal cruelty.
596 *International Journal of Offender Therapy and Comparative Criminology*, 49(6), 711-726.
- 597 Tallichet, S. E., & Hensley, C. (2009). The Social and Emotional Context of Childhood and Adolescent
598 Animal Cruelty Is There a Link to Adult Interpersonal Crimes? *International Journal of*
599 *Offender Therapy and Comparative Criminology*, 53(5), 596-606.
- 600 Tallichet, S. E., Hensley, C., & Singer, S. D. (2005). Unraveling the methods of childhood and
601 adolescent cruelty to nonhuman animals. *Society and Animals*, 13(2), 91-108.
- 602 Taylor, N., & Signal, T. D. (2005). Empathy and attitudes to animals. *Anthrozoos: A Multidisciplinary*
603 *Journal of The Interactions of People & Animals*, 18(1), 18-27.

604

605

ⁱ Local authorities in Scotland encompass all school districts within the authority.